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PRE-APPEAL BRIEF REQUEST FOR REVIEW	Docket Number (Optional) 043890-0927

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on _____ Signature _____ Typed or Printed Name _____	Application Number 10/585,729	Filed July 12, 2006
	First Named Inventor Tadashi MAEDA, et al.	
	Art Unit 1735	Examiner Erin Barry Saad

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☒ attorney or agent of record. Limited Recognition number L0123
- ☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

Signature

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Typed or printed name

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August 25, 2011

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of one form is submitted.

Docket No.: 043890-0927

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 53080
Tadashi MAEDA, et al.	:	Confirmation Number: 7206
Application No.: 10/585,729	:	Group Art Unit: 1735
Filed: July 12, 2006	:	Examiner: Erin Barry SAAD

For: PASTE FOR SOLDERING AND SOLDERING METHOD USING THE SAME

PRE APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Final Office Action dated May 25, 2011, having a three-month shortened statutory period for response set to expire on August 25, 2011, Applicants respectfully request reconsideration of the pending rejection for the reasons set forth below. A Notice of Appeal is being concurrently filed herewith.

REMARKS

Independent claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda et al. (US 6,189,771) in view of Mei (US 6,680,128) and further in view of the collective teachings of Kodas (US 6,951,666) and Kang et al (US, 5,837,119).

Applicants respectfully submit that, at a minimum, the claimed range of metal powder (1-20 vol%) would not have been obvious even in view of Mei. The Examiner asserted that Mei discloses that the solder component is mixed with flux by 50 vol%. The Examiner concluded that since the amount disclosed by Mei is a typical amount and the solder component affects the viscosity, ease of deposition, slumping, etc, it would have been obvious to modify Mei's amount of particle to arrive at the claimed range. Applicants disagree.

Applicants submit that one of ordinary skill in the art who is reviewing Mei would not have been motivated to reduce the amount of coated solder composition of Mei lower than 0 vol%. Applicants submit that Mei discloses that "**High concentrations** of solder powder are desirable to provide a solder thickness which is sufficient to provide the required degree of electrical conductivity and mechanical strength" (see, col. 4, line 67 to col. 5, line 5 of Mei). Mei is directed to "solder" itself, which requires high conductivity when melted and solidified. Accordingly, Mei discloses that high concentrations of "solder" powder are desirable to provide high electrical conductivity.

As such, even if the amount of 50% is typical in Mei, one of ordinary skill in the art who is reviewing Mei would not have been motivated to reduce the amount of the solder powder from 50 vol% to 1-20 vol%, which is less than a half of 50 vol%. If, *arguendo*, the amount of the solder powder in Mei were reduced to 20 vol% or less, the electrical conductivity of Mei's solder paste would be poor and such a solder paste would not function as intended. Since the alleged modification should not impair the purpose or functionality of the prior art (see, MPEP § 2143.01 and § 2145), the Examiner's alleged modification is clearly impermissible.

Further, the Examiner failed to provide any basis for a reasonable expectation of success in the alleged modification, which is required even in view of *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007) (see, MPEP § 2143.02). As set forth above, Mei is directed to a solder material itself. If the amount of solder powder is reduced less than 20 vol%, the amount of flux becomes more than 80 vol%. One of ordinary skill in the art would not reasonably expect that such a low

solder concentration paste would be usable for soldering as intended in Mei.

Moreover, Applicants submit that there is no reasonable expectation of success in combining Mei with Maeda. If, *arguendo*, the solder paste in Mei (50 vol% metal powder) were properly applied to Maeda (reflow process of a molten solder bump), it would be difficult for the molten solder bump to reach the second electrodes since vacancy for passing of the molten solder is limited by high concentration of metal powder. The soldered portion generated from Mei's solder paste would be sandwiched between the solder bump and the second electrode, which would cause failures to reliably connect two different composition layers of solder portions. In other words, the molten solder could reach the second electrode in such a combination. As such, since one of ordinary skill in the art would reasonably expect that alleged combination would fail to function as intended, there is no motivation or suggestion to combine Mei with Maeda.

In addition, Applicants respectfully submit that claim 4 would not have been obvious over the cited references because it would not have been obvious to combine the cited references as the Examiner asserted.

The Examiner asserted, in rejecting claim 4, that Mei discloses solder paste where a particular solder composition includes tin and zinc coated with silver. Applicants submit that the solder composition of Mei is in fact "solder" and is to be "melted" thereby soldering electrodes. In other words, the solder composition of Mei exhibits electrical conductivity between the electrodes when it is melted and solidified. Similarly, Maeda discloses melting and solidifying the solder to electrically connect electrodes.

The Examiner further asserted that Kang and Kodas disclose the use of flake-like shaped metal powder. Applicants submit, however, that the flake-like shaped powder of Kodas (e.g., Cu) is utilized for obtaining high conductivity (see, abstract). Specifically, Cu (see, col. 4, lines 54-55) is a high-melting point metal and dominates the conductivity, and thus the alleged flake-like shaped metal powder does not melt but should keep its flake-like shape. Similarly, in Kang, as shown in FIG. 3, flake-like shaped metal filler is utilized for better electrical conductivity (see, col. 5, lines 37-40) without the filler being melted.

In summary, Applicants submit that Maeda and Mei are directed to "solder" which is melted and solidified to obtain electrical conductivity, while Kodas and Kang are directed the metal particles or the filler which remain un-melted to obtain electrical conductivity. As such,

one of ordinary skill in the art who is reviewing Mei and Kodas/Kang would not have been motivated to combine Kodas/Kang with Mei because the requirements and properties of the metal powder are different between Mei and Kodas/Kang.

In addition, since the solder powder is melted during soldering in Mei/Maeda, one of ordinary skill in the art would not have been motivated to intentionally select a specific shape. As long as the solder powder is completely melted, the shape of the solder powder does not matter to Mei/Maeda. As such, there is no motivation or suggestion to combine Mei/Maeda with Kodas/Knag to arrive at claim 4.

As such, Applicants submit that claim 4 and all claims dependent thereon are patentable over the cited references.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

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Limited Recognition No. L0123

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